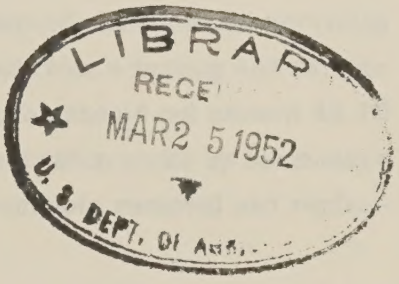
BASIC CONSIDERATIONS

IN

MAINTAINING WATTHOUR METERS



U. S. DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
TECHNICAL STANDARDS DIVISION

BASIC CONSIDERATIONS IN MAINTAINING WATTHOUR METERS

Reason for Testing: The income of the REA cooperative is obtained through the registration of the watthour meters. If meters are registering fast, they create ill-will and penalize the members of the cooperative. If meters are registering slow, the cooperative loses revenue and appears to be operating with high system losses. The mere fact that the cooperative is making every effort to see that the watthour meters are always in calibration improves the good will of the members.

Frequency of Testing: The maximum time between tests should not exceed eight years for domestic watthour meters. This conforms with recommendations of the American Standards Association. Experience has shown that test intervals of five years are preferable. In any case, the cooperative should conform to the minimum requirements of the local state utilities commissions. All new meters should be tested before initial installation.

Method of Maintenance: The cooperative can accomplish the meter maintenance in one of two ways: The work can be done by trained cooperative personnel in the meter shop (servicing with field kits at consumer locations should be limited to complaint testing only); or the work can be contracted out to properly qualified meter repair and servicing organizations. The choice of servicing method will depend upon the availability of trained metermen, location of the contract servicing organization, and number of meters to be serviced. It must be emphasized that first cost is not the most important item in deciding the proper method to use. The quality and completeness of the service and calibration should be the major consideration.

Cost of Maintenance: The cost of meter service by cooperative personnel will vary with local conditions. Contracted servicing costs will depend upon how the servicing is handled. If the cooperative transports the meters to and from a testing and service laboratory, the charge for complete overhaul and calibration should not exceed $2.00 per meter plus the cost of parts used. If the testing organization picks up the meters at the various locations on the cooperative and does the complete removal and replacing job, the charge may run as high as $4.00 per meter.

Degree of Maintenance: Practically all REA cooperative meters are outdoor installations. Under constant weathering, the watthour meter should be given very careful inspection and cleaning each time it is serviced and calibrated. As field conditions are rarely adequate for this work, it is recommended that the meters be serviced in a meter shop. The meters should be thoroughly cleaned, gaskets replaced, bearings

inspected and replaced where any doubt of condition exists. A high-voltage test of 1500 volts a-c should be applied to the meters before any servicing is done. This will eliminate many meters with damaged or weakened insulation. The meter, after thorough cleaning, inspection, and assembly must be calibrated to within a minimum of 99.5 percent true registration for both light and full load adjustments at unity power factor.

Cost of Equipping Meter Shop: The minimum equipment needed and approximate prices for adequate meter servicing are as follows:

Meter Test Board, table top design with 1500 volt a-c test	$475.00
Rotating Standard with 50 ampere range, needed in addition to the one in the field test kit	190.00
Check meters (3) for standard comparison. These are modified service meters, wall mounted in the shop	50.00
Standard Voltmeter, generally needed for calibration of all voltmeters	160.00
Ohmmeter, high and low range, needed for checks on coils	125.00
Miscellaneous tools and cleaning solutions, and apparatus	50.00
TOTAL	$ 1,050.00

In addition to the above equipment, the meter shop should be provided with a source of dry compressed air to aid in meter cleaning. When the test equipment is properly installed in a meter test shop that is well lighted, ventilated, heated, and located conveniently to the office and loading platforms it should be adequate for maintaining and calibrating all meters on most cooperatives. For example, if a cooperative has 10,000 meters in service and intends to service them at five year intervals, the daily work load would be only 8 meters per day if the work load could be scheduled perfectly during the 250 day work year. However, allowing for non-uniform work load, and about 10 percent of the meters having additional repair and calibration because of change-outs and damage in service, the work load would not likely exceed 25 meters per day. The above equipment, in the hands of experienced personnel, is adequate for servicing this quantity of meters with no difficulty. There may be local conditions that make it desirable for cooperatives to install dual position boards, photo-electric counters and cleaning machines to speed up the work, improve calibration accuracy and reduce labor costs.